AMENDMENTS TO THE CLAIMS

1 (Currently Amended). A radio transmitter within a radio transceiver for producing phase-shift keyed (PSK) and frequency-shift keyed (FSK) modulated communication signals, comprising:

baseband processor for producing transmit (TX) data and a TX control signal;

a digital modulator that receives TX data, that digitally modulates outgoing digital data to produce one of a[[n]] frequency shift keying (FSK) or phase-shift keying (PSK) modulated digital information signal based upon the TX control signal, wherein the digital modulator further includes:

modulation switching control block that receives the TX control signal, producing a modulation control signal to select one of a plurality of types of modulation data, the modulation switching control block also producing a multiplexer (mux) control signal to couple one of the plurality of types of modulation data to a mux output;

pulse shaping block for producing FSK phase information based upon a first value of the modulation control signal, which FSK phase information consists of one of a logic zero or a phase value for a FSK modulated signal based upon the TX data, the pulse shaping block further producing I and Q modulated data based upon the TX data for a second value of the pulse modulation control signal;

mux block coupled to receive the I and Q modulated data at a first input pair and further coupled to receive a logic one and a logic zero at a second input pair, the mux block producing the I and Q modulated data received at the first input pair based upon a first

value of the mux control signal and for producing the logic one and logic zero received at the second input pair based a second value of the mux control signal;

phase accumulator coupled to receive the FSK phase information, the phase accumulator producing an accumulated phase value;

a Coordinate Rotation Digital Computer (CORDIC) block coupled to receive the accumulated phase value and further coupled to receive the I and Q modulated data, the CORDIC block producing I and Q channel signals reflecting a phase and magnitude based upon the accumulated phase value and the I and Q modulated data wherein the CORDIC block produces outputs in one of three states based upon the FSK phase information and upon the I and Q modulated data and further wherein:

for a first state, the I and Q channel signals reflecting a rotated unit vector characterized by a phase reflecting the FSK phase information;

for a second state, I and Q channel signals reflecting a vector having a phase and a magnitude based upon the I and Q modulated data and further based upon the FSK phase information; and

for a third state, I and Q channel signals reflecting a vector having a phase and a magnitude based upon the I and Q modulated data;

DC offset compensation block coupled to receive the I and Q channel signals, the DC offset compensation block for pre-compensating for expected downstream low frequency interference, the DC offset compensation block producing compensated I and Q channel signals; and

interpolation filter producing up-sampled I and Q channel data characterized by an output sample rate based upon an input sample rate of the compensated I and Q channel signals;

digital to analog converter circuits for converting for converting the up-sampled I and Q channel data to analog I and Q channel signals having a continuous waveform;

filtering circuits for filtering the analog I and Q channel signals; and

~~phase-locked~~ loop circuitry for up-converting the analog I and Q channel signals from a baseband frequency to a specified RF channel.

2 (Original). The radio transmitter of claim 1 further including a requantizer within the digital modulator for reducing granularity of up-sampled I and Q channel data prior to the up-sampled I and Q channel data being converted to analog I and Q channel signals.

3 (Original). The radio transmitter of claim 1 wherein the TX data is produced by the baseband processor at one of a plurality of data rates and wherein the baseband processor produces the TX control signal to select one a plurality of corresponding modulation types.

4 (Original). The radio transmitter of claim 3 wherein the plurality of data rates comprise rates of 1 MHz and 2Mhz and corresponding modulation types of FS[[Q]]<u>K</u> and <u>quadrature phase-shift keying (</u>QPSK<u>)</u>.

5 (Original). The radio transmitter of claim 4 further comprising a data rate of 3 MHz and a corresponding modulation technique of 8-PSK.

6 (Original). The radio transmitter of claim 3 wherein the baseband processor is operating according to a legacy Bluetooth protocol.

7 (Original). The radio transmitter of claim 1 wherein the TX data is produced by the baseband processor at a data rate of 1 Mbps which 1 Mbps TX data is FSK modulated and wherein the radio transmitter increases the data rate to at least a 2 Mbps data rate, which increased data rate is transitioned from the FSK modulation to a PSK modulation without spectral mask violation

8 (Original). The radio transmitter of claim 1 wherein the pulse shaping block of the digital modulator further includes an FSK symbol mapper and a PSK symbol mapper, each of which is coupled to receive the TX data.

9 (Original). The radio transmitter of claim 8 wherein the FSK and PSK symbol mappers produce FSK phase data and constellation data, respectively, to a filter bank that, based upon the modulation control signal selects a corresponding filter of a plurality of filters.

10 (Original). The radio transmitter of claim 8 further comprised filtering means for filtering FSK and PSK symbols according to the modulation control signal.

11 (Original). A radio transmitter, comprising:

pulse shaping block coupled to receive TX data from a TX data source, the pulse shaping block producing FSK modulated TX data and PSK I and Q channel modulated data concurrently;

mux circuitry coupled to receive the PSK I and Q channel modulated data and a logic 1 and a logic 0;

wherein the pulse shaping block FSK modulates a stream of 0 bits and produces a stream of FSK modulated 0 values and PSK modulated I and Q data based on a first logic state of a mode control signal and further produces FSK modulated TX data for a second logic state of the mode control signal; and

wherein the mux control circuitry couples the PSK I and Q channel modulated data to downstream modulation circuitry for the first logic state of the mode control signal and wherein the mux control circuitry couples the logic 1 and logic 0 to the downstream modulation circuitry for the second logic state of the mode control signal.

12 (Original). The digital modulator of claim 11 wherein the downstream circuitry coupled to the mux comprises a coordinate rotation digital computer (CORDIC).

13 (Original). The digital modulator of claim 12 further comprising a phase accumulator coupled to receive the FSK modulated TX data and the modulated 0 values from the pulse shaping block, the phase accumulator producing an accumulated phase value.

14 (Original). The digital modulator of claim 13 wherein the CORDIC produces one of FSK or PSK modulated digital information signal further comprising I and Q channel modulated signals which are modulated based upon the accumulated phase value and the PSK I and Q modulated data.

15 (Original). The radio transmitter of claim 11 wherein the radio transmitter initially transmits in an FSK modulation mode of operation and, while in the FSK modulation mode, transmits ID information in the FSK modulation mode.

16 (Original). The radio transmitter of claim 15 wherein the radio transmitter determines that a remote communication device with which the radio transmitter is communicating is capable of higher data rate PSK modulation mode communications.

17 (Original). The radio transmitter of claim 16 wherein the radio transmitter transitions to the higher data rate PSK modulation mode communications during a transition period and, after the transition period, communicates in the higher data rate PSK modulation mode communications.

18 (Original). The radio transmitter of claim 17 wherein, while in the transition period, the radio transmitter does not violate spectral mask requirements.

19 (Original). A method in a radio transmitter, comprising:

producing, to a phase accumulator, FSK phase information based upon a first mode of operation and zero value phase information based upon a second mode of operation;

producing meaningful I and Q channel information to a multiplexer during the second mode of operation;

producing accumulated phase information from the accumulator to a coordinate rotation digital computer (CORDIC); and

producing, from the multiplexer to the CORDIC, a logic one and a logic zero during the first mode of operation and producing the meaningful I channel and Q channel information during a second mode of operation.

20 (Original). The method of claim 19 further including producing, from the CORDIC, one of an FSK or a PSK modulated digital information signal, which, in the first mode of operation is based upon the logic one, the logic zero and the accumulated phase information and in the second mode of operation is based upon the accumulated phase information and upon the meaningful I and Q channel information.

21 (Original). A method in a radio transmitter, comprising:

in a first communication mode, transmitting communication signals with a remote agent according utilizing a first modulation technique at a first data rate;

determining that the remote agent is capable of communicating using a modulation technique at a second data rate;

in a transition mode, transmitting communication signals with the remote agent according to the first and second modulation techniques at the second data rate during a transition period;

in a second communication mode, transmitting communication signals with the remote agent solely utilizing the second modulation technique at the second data rate; and

during the first and second communication modes and during the transition mode, transmitting within a spectral mask without spectral leakage.